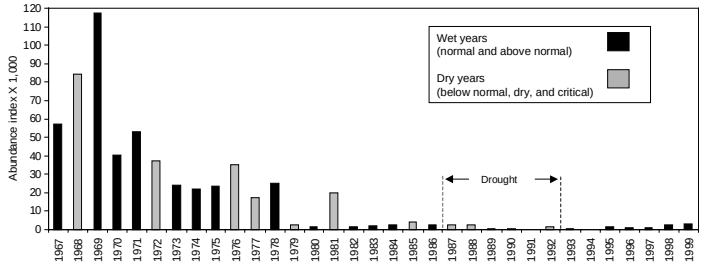
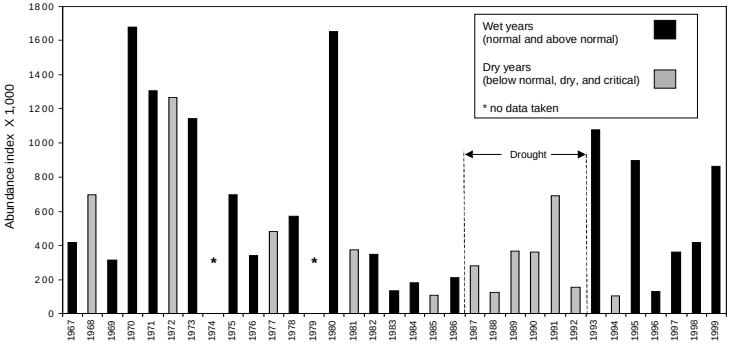
Annual abundance indices for adult winter-run Chinook salmon



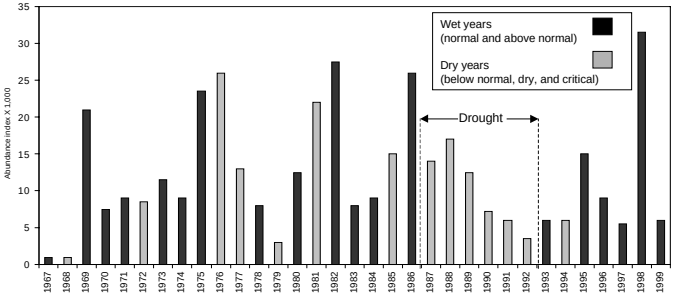
- Abundance index based on adult escapement data
- Abundance was low before the drought (1987-1992), but declined to very low levels during the drought
- Abundance has remained at low levels since 1993 despite six wet years
- Factors which may affect abundance:
  - ocean harvest
  - large scale climatic events (e.g., el niño/la niña)
  - access to spawning areas
  - water diversions
  - upstream habitat conditions (e.g., water temperatures in spawning areas)

Annual abundance indices for Delta smelt



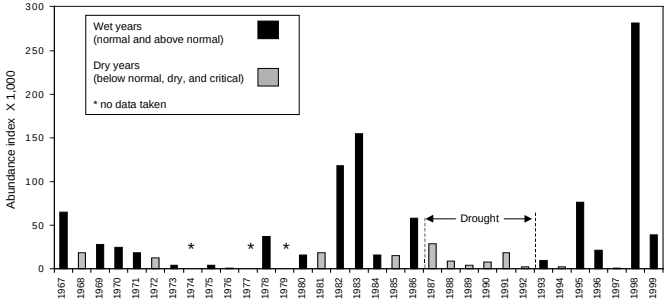
- Abundance index based on data from the Fall Midwater Trawl Survey
- Abundance did not change dramatically during the drought (1987-1992)
- Abundance has been variable in post drought years with some high values (e.g., 1993, 1995, and 1999)
- Factors which may affect abundance:
  - entrainment
  - predation
  - hydrologic conditions
  - competition with exotics for food (i.e., zooplankton)
  - declines in native food base
  - water quality conditions (e.g., high water temperature during reproduction, contaminants)

Annual abundance indices for adult spring-run Chinook salmon



- Estimates based on carcass counts
- Abundance index based on adult escapement data
- Factors which may affect abundance
  - ocean harvest
  - large scale climatic events (e.g., el niño/la niña)
  - access to spawning areas
  - water diversions
  - upstream habitat conditions (e.g., water temperature in spawning areas)

Annual abundance indices for splittail



- Abundance index based on data from the Fall Midwater Trawl Survey
- Abundance declined during the drought (1987-1992)
- Abundance rebounded in 1995 and 1998 to record levels
- Hydrologic conditions are very important to successful splittail recruitment
- Factors which may affect abundance:
  - floodplain inundation
  - duration and extent of high outflows

Figure 2-2
Historical Abundance, Selected Fish Species